

NITROARENES (SELECTED)

The nitroarenes comprise a large class of structurally related chemicals and encompass several carcinogens including 1-nitropyrene, 4-nitropyrene, 1,6-dinitropyrene, 1,8-dinitropyrene, and 6-nitrochrysene. These meet the criteria established for listing as "reasonably anticipated to be a human carcinogen" primarily on the basis of carcinogenicity results with experimental animals. Although these chemicals have limited intentional uses, they are normally found in particulate emissions from many combustion sources, most notably, diesel exhausts. The mutagenicity and carcinogenicity of nitroarenes vary, but those that are positive appear to be active at relatively low concentrations when compared to other classes of chemicals also positive in experimental systems.

Few of this large class of chemicals have been rigorously evaluated in "state-of-the-art" rodent cancer studies. Typically, the chemicals were administered by injection, over short periods of times, and with less than optimal time allowed for tumors to fully develop. Despite these factors, the experimental carcinogenesis results are generally similar and demonstrate tumor formation at sites away from as well as at the site of injection. The chemicals also show genotoxic activity in a variety of *in vitro* and *in vivo* assays, and metabolic pathways for the creation of reaction products with the ability to cause gene mutations or changes in the structure of DNA have been described in tissues from animals as well as humans.

No studies on the potential carcinogenicity of these chemicals in humans were identified. However, diesel engine exhausts have been evaluated for carcinogenic potential by the IARC (1989). The IARC Working Group of Experts concluded that there was "limited evidence for the carcinogenicity of diesel exhaust to human" and "sufficient evidence for carcinogenicity to experimental animals." There is also "sufficient evidence of carcinogenicity" to experimental animals of extracts of diesel exhaust which contain the nitroarene fraction. Whether the nitroarenes are responsible for, or contribute to the human carcinogenicity of diesel exhaust has not been determined.

Profiles in this section include the following:

- 1,6-Dinitropyrene, CAS No. 42397-64-8, pp. III-404 to III-405
- 1,8-Dinitropyrene, CAS No. 42397-65-9, pp. III-406 to III-407
- 6-Nitrochrysene, CAS No. 7496-02-8, pp. III-408 to III-409
- 1-Nitropyrene, CAS No. 5522-43-0, pp. III-410 to III-411
- 4-Nitropyrene, CAS No. 57835-92-4, pp. III-412 to III-413